

SSN 688 Class Auxiliary Equipment Inspection Guide

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Section	EQUIPMENT / INSPECTION	TIMING	REMARKS / SPEC
1	Arrival & Inbrief		
1.1	INBRIEF	IP	
1.1.1	Inspector & ship review inspection guide	IP	
1.1.2	Ship Questions	IP	
2	Ship Preparations & Actions		
2.1	Provide tech manuals for trim & drain pump, CO2 scrubber	IP	Place in area used by INSURV board during inspection.
2.2	Empty hydraulic accumulator tell-tale drain bottles	IP	S/F Identify Leak Rate criteria Time:
2.3	Remove oil from hydraulic pump mechanical seal areas	IP	S/F Identify Leak Rate criteria Time:
2.4	Provide the most current "as found" conditions for URO/16	IP	URO/MRC-16
2.5	Provide logs for week prior to Inspection	IP	Below Decks, Aux Fwd, HPAC, HPAD, LPAC, LPAD, HPP
3	Inspector Preparation & Record Review		
3.1	Review CSMP, CO Letter, CASREP's, DFS's	IP	
3.2	Review flex hose records (SSN)	IP	
3.3	Review dew point data for HPAD and air banks.	AN	5511/S-1R, 5542/S-9R PMT tasked in services message
3.4	Open & Inspect list	IT	Provided by recorder prior to return to port.
4	Oil Samples		
4.1	Scrubber compressors	AN	5154/R-14
4.2	HPAC's		5515/S-3R
4.3	LP blower		5541/A-2
4.4	Sanitary pump		5282/W-2
4.5	Return headers		A-054/S-4R
4.6	R-134a compressors		A-006/Q-6: Draw sample from initially idle unit. Shift units for second sample after inspector has completed operating unit inspection.
4.7	External hydraulics header		5562/Q-13R, HE-43
4.8	External hydraulics vent & supply tank (water content)		5562/Q-13R, HE-83
5	OBSERVED SHIP EVOLUTIONS		
5.1	Observe depth control operations.	SB	SSM. PD evolution
5.3	Angles & dangles	SB	Both Scrubbers, O2 Generator Operating
5.4	Test operation of MBT vent valves in manual and local power	TD	SSM
5.5	Test AMR flood control	TD	URO-25 for closures
5.6	Emergency surface	SB	URO/MRC-22. Achieve min. 15deg. rise, AX inspector in control
5.7	Surfacing evolution	IT	Inspect LP Blower for leaks, noise, oil level, temp. Oil pressure 18 ± 2 psig.
6	DIESEL		
6.1	Diesel operation, trend	IT	3121/S-3R, operation and shutdowns
6.2	Snorkel safety	IT	SSM, NSTM
6.3	Test diesel coolant	IT	3121/M-5R
6.4	Review diesel pressure switch data	IT	
6.5	Review diesel records	IT	NSTM Chapters, logs
6.6	Diesel operational checks:	PD	SSM OP and OI: Check submerged op. parameters 3422/R-5, R-6D: DLO dilution & viscosity check 3422/Q-2: DFO clear and bright

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			Transfer fuel through filter separator
6.7	Install diesel spare governor	SB	Diesel tech manual
6.6	Run diesel with spare governor	IT	SSM OI
7	SNORKEL SYSTEM		
7.1	Verify lubrication of induction and exhaust valves	AN	3423/Q-3
7.2	Time outboard induction and exhaust valves	OT	3423/S-1R
8	BLOW / BALLAST SYSTEMS		
8.1	LP blower operation	OT or IT	Run until oil temp stabilizes. Check for noise, oil level, oil leaks, air leaks
9	OXYGEN GENERATOR		
9.1	Drop test	OT	Tech Manual (If not accomplished prior to INSURV arrival)
9.2	Gas analyzer check	OT	5154/R-5M (If not accomplished prior to INSURV arrival)
9.3	Pre-startup checks	OT	Tech Manual (If not accomplished prior to INSURV arrival)
9.4	Normal operation	SB	Tech Manual and SSM
9.5	Verify in-place gauge calibration	AN	5154/A-3
9.6	Inspect drier molecular sieve cartridge	SB	5154/R-6
9.7	Verify testing of cell lifting rig	AN	5154/48M-3
9.8	Successful operation at large angles	SB	Verify unit does not shut down during angles and dangles. Run at 1050 Amps.
10	OXYGEN SYSTEM		
10.1	Inspect greasing of remote operator	AN	A-086/S-1R
10.2	Verify correct set-up of remote O2 hull valve operators	AN	SSM, Technical Manual
10.3	Test remote operator closure capability	IP	A-086/A-1R, A-2R, or A-3R, as applicable: provide latest data form.
11	CO-H2 BURNERS		
11.1	Conduct short-term monitoring of burner operating parameters	AN	A-088/Q-3: SF perform PM and provide data sheets to inspector.
11.2	Review burner operating logs	IP	
12	CO2 SCRUBBERS		
12.1	Review scrubber logs	IP	
12.2	Inspect absorber air inlet screen for cleanliness	AN	5151/S-2
12.3	CO2 scrubber capacity	SB	5151/S-5R: SF perform PM and provide data sheets to inspector.
12.4	CO2 scrubber performance	SB	Plot performance on curves in Tech Manual
12.5	CO2 scrubber MEA	SB	Lean & Rich Samples: check for color and corrosion products.
12.6	Test monoethanolamine in storage tanks	AN	5151/18M-1R
13	O2 CANDLE FURNACE		
13.1	Clean and inspect furnace	AN	5154/R-2
14	HPAC		
14.1	Oil filter check	AN	5515/A-5: Check red button in filter housing exposed < 3/16" during operational checks. Perform full PM if > 3/16"
14.2	Operational test & passive checks	AN	5515-Q-4R: SF perform PM and provide data sheets to inspector.

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14.3	Stage temp/press	AN	S6220-E6-TTM-010
14.4	Blowdown system	AN	S6220-E6-TTM-010
14.5	Oil leaks	AN	
14.6	Review pressure switch data	AN	5515/A-1R, A-2R: PMT: high pressure cutout, low oil pressure
14.7	Review logs from underway	IP	S6220-E6-TTM-010
15	HPAD		
15.1	Review pressure and temp switch data	AN	5511/A-1, A-2: Temp controller & safety pressure switches
15.2	Observe normal operation	IT	SSM, Tech Manual
15.3	Review operating logs	IP	SSM, Tech Manual
16	HP AIR		
16.1	Time AHP-76 Marotta	AN	SSM, Valve Tech Manual
16.2	Inspect HP air system reducer filter differential pressure indicators	AN	5511/Q-8
16.3	Inspect air bank Marotta valve(s)	AN	SSM
17	LPAC		
17.1	Review pressure switch data	AN	5512/A-6R, A-7R: PMT tasked on services message
17.2	Check bypass valve operation	AN	5512/A-2
17.3	Inspect air inlet filter	AN	5512/A-5
17.4	Verify normal operation of LPAC	AN	SSM
17.5	Review LPAC logs	IP	
18	LPAD		
18.1	Test low purge air flow switch	AN	5512/S-2: Need to catch it while the heater is on.
18.2	Test automatic dump valve	AN	5512/W-2
18.3	Inspect air cooled condenser	AN	5512/S-1
18.4	Check Overall Condition	AN	SSM, Tech Manual
18.5	Review LPAD logs	IP	
19	LP AIR		
19.1	Inspect service air system and reducer filter differential pressure indicators	AN	5519/R-1
19.2	Service air automatic stop valves	AN	5519/Q-3
20	SALVAGE AIR SYSTEM		
20.1	Verify lubrication of internal air salvage valve swivel gear joints	AN	5941/A-10
20.2	Check salvage air hull valves	AN	SSM
21	VENTILATION		
21.1	Ventilation filters	IT or IP	5132/M-1
21.2	Ventilation ducting	IT or IP	5132/Q-3, Q-4, Q-5, Q-6
21.3	Inspect bulkhead valves	IT or IP	5132/S-1
22	R-134 / REFRIGERATION		
22.1	#1 Unit operating: observe operating parameters	AN	A-006/S-3R: Lube oil level and foaming, pressures, temps, frost buildup on lines, flex hose labels, mechanical seal
22.2	#2 Unit operating: observe operating parameters	AN	A-006/S-3R: Lube oil level and foaming, pressures, temps, frost buildup on lines, flex hose labels, mechanical seal
22.3	Inspect freeze box	AN	A-006/Q-1: Condition of door gaskets, ice buildup on cooling coils, TXV sensing line position and insulation
22.4	Inspect chill box	AN	A-006/Q-1: Condition of door gaskets, ice buildup on cooling coils, TXV sensing line position and insulation
22.6	Inspect TXV areas	AN	A-006/24M-4R: Excessive icing indicates lagging problem
22.7	Inspect moisture indicators	AN	A-006/W-1R

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22.8	Refrigerant leak check	AN	A-006/S-5R
22.9	Review logs	AN	NAVMED P-5010: Freeze box: -5 to 0 deg; Chill box: 33 to 35 deg
23	STEERING & DIVING GEAR NOTE: Phones manned in Shaft Alley and Control for Stern and Rudder testing		
23.1	Surfaced ahead steering gear in normal and emergency	OT	OOD: 0-HL-HR-0, verify course, 0-HR-HL-0, repeat in EMER
23.2	Surfaced astern steering gear in normal and emergency	OT	OOD: 0-HL-HR-0, verify course, 0-HR-HL-0, repeat in EMER
23.3	Test planes prior to submerging and submerge ship	OT	SSM (Inspector in Control)
23.4	TD-100 ft. Inspect control surfaces for binding, normal power only.	DD	Only Normal Power, All surfaces, phone talkers required. OOD: hard to opposite hard to zero.
23.5	Time control surfaces just below the rig for high speed line of SOE	SB	URO/MRC-16, 5613/9M-1R: Normal and emergency power, all surfaces. Phone talkers required. Usually scheduled after deep dive.
23.51	Rudder (35 +/-0.5)	SB	OOD: 0-HL-HR-0, verify course, 0-HR-HL-0, repeat in EMER
23.52	Stern planes (25 +/-0.5)	SB	OOD: 0-HR-HD-0, verify depth, 0-HD-HR-0; repeat in EMER
23.53	Fairwater or bow planes (20 +/-0.5)	SB	OOD: 0-HR-HD-0, verify depth, 0-HD-HR-0; repeat in EMER
24	SHIP SERVICE HYDRAULICS		
24.1	Inspect pump discharge differential pressure indicators	SB	A-054/Q-3, S-2
24.2	Inspect return line differential pressure indicators	SB	A-054/Q-6
24.3	Inspect pressure potentiometer rollers	SB	A-054/S-1
24.4	Inspect pilot control valve differential pressure indicators	SB	A-054/A-3R
24.5	Mech Seal Leakoff	SB	Tech Manual: 5 drops/hr
24.6	Accumulator Leak-off	SB	Tech Manual: 250 ml/day
24.7	Inspect overall plant condition and leak check	SB	
25	STEERING AND DIVING HYDRAULIC PLANT		
25.1	Inspect In-Line Filter Differential Pressure Indicators	AN	A-001/S-5
25.2	Inspect pump discharge differential pressure indicators	SB	A-001/Q-4, S-8
25.3	Inspect return line differential pressure indicators	SB	A-001/Q-6
25.4	Inspect pilot control valve differential pressure indicators	SB	A-001/R-2W
26	EXTERNAL HYDRAULICS		
26.1	External hydraulic pump testing	SB	5562/S-4 (when ext hyd not req)
26.2	Accumulator leak-off	SB	Tech manual: 250 ml/day
26.3	Inspect external pump discharge filter differential pressure indicator	AN	5562/S-1R
26.4	Inspect plant for leaks and cleanliness	AN	Tech manual
27	TRIM, DRAIN & SAN		
27.1	Trim pump strainers	OT/SB	A-118/S-11R: proper fasteners, basket condition, A&I completed on handles
27.2	Drain pump strainers	OT/SB	A-118/W-3: proper fasteners, basket condition, A&I

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			completed on handles
27.3	Trim and drain pump seal water	SB	SSM
27.4	Trim pump capacity check	TD	Pump at max continuous RPM
27.5	Drain pump capacity check	TD	Pump at max continuous RPM
27.6	Observe pumping to and from all trim tanks with the trim pump	AN	SSM
27.7	Inspect priming pump tank levels	AN	SSM
27.8	Inspect condition of priming pumps, tanks, and associated valves and piping	AN	SSM, Tech manual
27.9	Sanitary pump capacity check	TD	SSM: pump one san tank
27.10	Conduct in-place inspection of san pump drive belt	AN	5282/A-2
28	HOVERING AND DEPTH CONTROL		
28.1	Inspect hovering and depth control valves or leaks	AN	5633/Q-1
29	DEPTH GAGE		
29.1	Verify isolation of shallow depth gauge on SCP below 200 feet	AN	SSM
29.2	Inspect depth gauge piping for leaks	AN	
30	POTABLE WATER AND PLUMBING		
30.1	Inspect trash compactor Y-strainer	AN	5282/M-3
30.2	Inspect deodorizer filters	AN	5282/A-1
30.3	Inspect for plumbing valve lubrication	AN	5282/S-1
30.4	Inspect potable water pumps	AN	SSM, Technical Manual
31	TDU		
31.2	Test TDU interlocks / operation	AN	5934/Q-3, S-1R: Perform PMS with inspector
31.3	Inspect TDU torque wrench	AN	5120-00-247-2540: Correct wrench and calibration
31.4	Test compactor interlocks	AN	5934/Q-9R: Perform PMS with inspector
31.5	Inspect TDU shafts	AN	5934/S-6R
31.6	TDU ball valve leak check	SB	5934/S-4R: Discuss condition of ball valve with inspector before performing check
31.7	TDU flood control timing	AN	URO/MRC-25
32	MISC & SUPPORT EQUIPMENT		
32.1	Inspect pneumatic grease guns	AN	T6350-AA-HBK-010: Regulator not flow meter style w/ oil separator IAW FLASH 12/01
32.3	Review oil analysis records	AN	
32.4	Spot check flex hoses	AN	5000/A-1, A-2, A-3
32.5	Review lubrication DWG/EGL	AN	
32.6	Blow a sea chest	SB	SSM OI
33	ZONE INSPECTIONS		
33.1	Capstan space zone inspection	AN	MBT actuator oil levels/grease
33.3	AMR zone inspections	AN	
33.4	Fan room zone inspection	AN	Fan room door, stowage, O2 station/gauges
33.5	TDU Room zone inspection	AN	
33.6	Shaft alley zone inspection	AN	MBT actuator oil levels/grease, O2 station/ bank stop valves/gauges, dive stop nuts

Open and Inspect Items		
Standard Items		
Diesel Engine and Systems	IP	
<i>Inspection covers</i>		Upper and lower crankcase, air box, exhaust header, vertical drive
<i>Scavenging blower</i>		3121/18M-4R: open discharge and measure clearances
<i>DLO, DFO</i>		3422/A-3R, 18M-1R: filters
<i>DFW</i>		Pump
<i>Special tools, OSI</i>		Spot check
Oxygen Generator	IP	
<i>Inspection covers</i>		5154/S-7R
<i>Replace DI and cooling water filters</i>		
CO/H2 Burner	IP	
<i>Catalyst level</i>		A-088/M-8R
<i>LiCO level</i>		A-088/S-1R
<i>Inlet air filter</i>		A-088/R-3
EAB Filters	IP	5519/A-1: remove & inspect one fwd, one aft
CO2 Scrubber	IP	
<i>Resin bags</i>		
<i>Strainers</i>		
<i>Boiler float valve</i>		
<i>Inlet air filter</i>		
HPAC Cuno filters	IP	5515/Q-5R
Conditional Items		
LPAD	IP	As directed by inspector.
Hydraulic Power Plant	IP	As directed by AX Inspector
<i>Filters</i>	IP	Any filter with OOS D/P
<i>HYD Pump Mech Seal</i>	IP	As directed by AX Inspector
<i>Test Hydraulic Plant Emergency Modes</i>	IP	A-054/R-1, A-001/R-5, if directed based on underway parameters. Report deficiencies to inspector.
LP Blower	IP	As directed by inspector.
<i>Lube Oil Strainer</i>	IP	
<i>Lube Oil Sump</i>	IP	
<i>Suction Pipe (internal clearances)</i>	IP	
EMBT Blow	IP	Any Parker check valve that failed to re-seat. Prepare package to open blow valves that feed failed Parker check.

Timing Codes

AN Anytime
 DD Deep Dive
 IP In Port
 IT Inbound Transit
 OT Outbound Transit
 SB Submerged
 TD Test Depth

All specifications are in accordance with relevant tech manuals, Maintenance Record Cards and Ship Systems Manuals.